

SUMMARY DATA FOR CASE 1D

This section contains the following economic data for case 1D:

- Capital Investment and Revenue Requirement Summary
- Total Plant Cost

CAPITAL INVESTMENT & REVENUE REQUIREMENT SUMMARY			
TITLE/DEFINITION			
Case:	Natural Gas Combined Cycle-1x1"H"		
Plant Size:	384.4 (MW,net)	HeatRate:	6,366 (Btu/kWh)
Primary/Secondary Fuel(type):	Natural Gas	Cost:	2.70 (\$/MMBtu)
Design/Construction:	2.5 (years)	BookLife:	20 (years)
TPC(Plant Cost) Year:	1999 (Dec.)	TPI Year:	2000 (Jan.)
Capacity Factor:	65 (%)	CO ₂ Removed:	(tons/year)
CAPITAL INVESTMENT			
		\$x1000	\$/kW
Process Capital & Facilities		152,299	396.2
Engineering(incl.C.M.,H.O.& Fee)		9,138	23.8
Process Contingency		5,172	13.5
Project Contingency		24,141	62.8
TOTAL PLANT COST(TPC)		\$190,749	496.2
TOTAL CASH EXPENDED	\$190,749		
AFDC	\$10,166		
TOTAL PLANT INVESTMENT(TPI)		\$200,916	522.6
Royalty Allowance			
Preproduction Costs		5,833	15.2
Inventory Capital		496	1.3
Initial Catalyst & Chemicals(w/equip.)			
Land Cost		164	0.4
TOTAL CAPITAL REQUIREMENT(TCR)		\$207,409	539.5
OPERATING & MAINTENANCE COSTS (2000 Dollars)			
		\$x1000	\$/kW-yr
Operating Labor		1,720	4.5
Maintenance Labor		1,604	4.2
Maintenance Material		2,406	6.3
Administrative & Support Labor		831	2.2
TOTAL OPERATION & MAINTENANCE		\$6,560	17.1
FIXED O & M			10.81 \$/kW-yr
VARIABLE O & M			0.11 ¢/kWh
CONSUMABLE OPERATING COSTS,less Fuel (2000 Dollars)			
		\$x1000	¢/kWh
Water		228	0.01
Chemicals		258	0.01
Other Consumables			
Waste Disposal			
TOTAL CONSUMABLE OPERATING COSTS		\$486	0.02
BY-PRODUCT CREDITS (2000 Dollars)			
FUEL COST (2000 Dollars)		\$37,624	1.72
PRODUCTION COST SUMMARY			
	Levelized (Over Book Life \$)		
	\$/ton CO₂		¢/kWh
Fixed O & M		10.8/kW-yr	0.19
Variable O & M			0.11
Consumables			0.02
By-product Credit			
Fuel			1.72
TOTAL PRODUCTION COST			2.04
LEVELIZED CARRYING CHARGES(Capital)			
		74.5/kW-yr	1.31
LEVELIZED (Over Book Life) BUSBAR COST OF POWER			
			3.35

ESTIMATE BASIS/FINANCIAL CRITERIA for REVENUE REQUIREMENT CALCULATIONS			
GENERAL DATA/CHARACTERISTICS			
Case Title:	Natural Gas Combined Cycle-1x1"H"		
Unit Size:/Plant Size:	384.4 MW _{net}	384.4 MWe	
Location:	East-West Region		
Fuel: Primary/Secondary	Natural Gas		
Energy From Primary/Secondary Fuels	6,366 Btu/kWh	Btu/kWh	
Levelized Capacity Factor / Preproduction(equivalent months):	65 %	1 months	
Capital Cost Year Dollars (Reference Year Dollars):	1999 (December)		
Delivered Cost of Primary/Secondary Fuel	2.70 \$/MBtu	\$/MBtu	
Design/Construction Period:	2.5 years		
Plant Startup Date (1st. Year Dollars):	2000 (January)		
Land Area/Unit Cost	100 acre	\$1,644 /acre	
FINANCIAL CRITERIA			
Project Book Life:	20 years		
Book Salvage Value:	%		
Project Tax Life:	20 years		
Tax Depreciation Method:	Accel. based on ACRS Class		
Property Tax Rate:	1.0 % per year		
Insurance Tax Rate:	1.0 % per year		
Federal Income Tax Rate:	34.0 %		
State Income Tax Rate:	%		
Investment Tax Credit/% Eligible	%	%	
Economic Basis:	Over Book LifeConstant Dollars		
Capital Structure	<u>% of Total</u>	<u>Cost(%)</u>	
Common Equity	45	12.00	
Preferred Stock	10	8.50	
Debt	45	9.00	
Weighted Cost of Capital:(after tax)		8.76 %	
Escalation Rates	Over Book Life	1999 to 2000	
General	% per year	% per year	
Primary Fuel	% per year	% per year	
Secondary Fuel	% per year	% per year	

Client: Project:		EPR/DOE VISION 21 INNOVATIVE POWER CYCLES		Report Date:		12-Jul-2000 10:55 AM						
Case: Plant Size:		TOTAL PLANT COST SUMMARY		Cost Base (Dec)		1999 (\$x1000)						
		Natural Gas Combined Cycle-1x1"H"		Estimate Type: Conceptual								
		384.4 MW,net										
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor Direct	Labor Indirect	Sales Tax	Bare Erected Cost \$	Eng'g CM H.O.& Fee	Contingencies Process	Project	TOTAL PLANT COST \$	\$/KW
1	COAL & SORBENT HANDLING											
2	COAL & SORBENT PREP & FEED											
3	FEEDWATER & MISC. BOP SYSTEMS	3,352	2,835	4,563	319		\$11,069	664		2,742	\$14,475	38
4	GASIFIER & ACCESSORIES											
4.1	Gasifier & Auxiliaries											
4.2	High Temperature Cooling											
4.3	Recycle Gas System											
4.4-4.9	Other Gasification Equipment											
	SUBTOTAL 4											
5A	GAS CLEANUP & PIPING											
5B	CO ₂ REMOVAL & COMPRESSION											
6	COMBUSTION TURBINE/ACCESSORIES											
6.1	Combustion Turbine Generator	47,902	320	3,570	250		\$51,722	3,103	5,172	6,000	\$65,997	172
6.2-6.9	Combustion Turbine Accessories	47,902	320	529	37		\$886	53		282	\$1,221	3
	SUBTOTAL 6			4,099	287		\$52,608	3,156	5,172	6,281	\$67,218	175
7	HRSG, DUCTING & STACK											
7.1	Heat Recovery Steam Generator	13,986	281	5,745	402		\$20,133	1,208		2,134	\$23,476	61
7.2-7.9	HRSG Accessories, Ductwork and Stack	13,986	281	402	28		\$711	43		226	\$980	3
	SUBTOTAL 7			6,147	430		\$20,844	1,251		2,360	\$24,455	64
8	STEAM TURBINE GENERATOR											
8.1	Steam TG & Accessories	12,840	370	2,813	197		\$15,849	951		1,680	\$18,480	48
8.2-8.9	Turbine Plant Auxiliaries and Steam Piping	4,028	370	4,448	311		\$9,158	549		1,725	\$11,432	30
	SUBTOTAL 8	16,868	370	7,261	508		\$25,007	1,500		3,405	\$29,912	78
9	COOLING WATER SYSTEM	3,486	2,799	4,701	329		\$11,315	679		2,381	\$14,375	37
10	ASH/SPENT SORBENT HANDLING SYS											
11	ACCESSORY ELECTRIC PLANT	3,955	1,968	7,129	499		\$13,551	813		2,478	\$16,842	44
12	INSTRUMENTATION & CONTROL	2,010	253	2,459	172		\$4,893	294		706	\$5,893	15
13	IMPROVEMENTS TO SITE	1,143	621	4,326	303		\$6,392	384		2,033	\$8,808	23
14	BUILDINGS & STRUCTURES		2,389	3,954	277		\$6,620	397		1,754	\$8,772	23
	TOTAL COST	\$92,701	\$11,835	\$44,638	\$3,125		\$152,299	\$9,138	\$5,172	\$24,141	\$190,749	496

Client: EPRIDOE VISION 21		Report Date: 12-Jul-2000										
Project: INNOVATIVE POWER CYCLES		10:55 AM										
Case: Natural Gas Combined Cycle-1x1"H"		Cost Base (Dec) 1999 (\$x1000)										
Plant Size: 384.4 MW,net		Estimate Type: Conceptual										
TOTAL PLANT COST SUMMARY												
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor		Sales Tax	Bare Erected Cost \$	Eng'g CM H.O. & Fee	Contingencies		TOTAL PLANT COST \$	\$/kW
				Direct	Indirect				Process	Project		
1	COAL & SORBENT HANDLING											
	1.1 Coal Receive & Unload											
	1.2 Coal Stackout & Reclaim											
	1.3 Coal Conveyors & Yd Crush											
	1.4 Other Coal Handling											
	1.5 Sorbent Receive & Unload											
	1.6 Sorbent Stackout, Storage & Reclaim											
	1.7 Sorbent Conveyors											
	1.8 Other Sorbent Handling											
	1.9 Coal & Sorbent Hnd. Foundations											
	SUBTOTAL 1											
2	COAL & SORBENT PREP & FEED											
	2.1 Coal Crushing & Drying											
	2.2 Prepared Coal Storage & Feed											
	2.3 Coal & Sorbent Feed System											
	2.4 Misc. Coal Prep & Feed											
	2.5 Sorbent Prep Equipment											
	2.6 Sorbent Storage & Feed											
	2.7 Sorbent Injection System											
	2.8 Booster Air Supply System											
	2.9 Coal & Sorbent Feed Foundation											
	SUBTOTAL 2											
3	FEEDWATER & MISC. BOP SYSTEMS											
	3.1 Feedwater System	912	1,773	1,386		97	\$4,167	250	884		\$5,301	14
	3.2 Water Makeup & Pretreating	203	21	170		12	\$406	24	129		\$560	1
	3.3 Other Feedwater Subsystems	511	191	254		18	\$974	58	206		\$1,239	3
	3.4 Service Water Systems	114	242	1,246		87	\$1,690	101	537		\$2,328	6
	3.5 Other Boiler Plant Systems	606	245	449		31	\$1,332	80	282		\$1,694	4
	3.6 FO Supply Sys & Nat Gas	153	288	398		28	\$867	52	184		\$1,103	3
	3.7 Waste Treatment Equipment	305		260		18	\$583	35	186		\$804	2
	3.8 Misc. Power Plant Equipment	549	74	398		28	\$1,049	63	333		\$1,445	4
	SUBTOTAL 3	\$3,352	\$2,835	\$4,563		\$319	\$11,069	\$664	\$2,742		\$14,475	38
4	GASIFIER & ACCESSORIES											
	4.1 Gasifier & Auxiliaries											
	4.2 High Temperature Cooling											
	4.3 Recycle Gas System											
	4.4 Booster Air Compression											
	4.5 Misc. Gasification Equipment											
	4.6 Other Gasification Equipment											
	4.8 Major Component Rigging											
	4.9 Gasification Foundations											
	SUBTOTAL 4											

Client: EPRI/DOE VISION 21		Report Date: 12-Jul-2000										
Project: INNOVATIVE POWER CYCLES		10:55 AM										
Case: Natural Gas Combined Cycle-1x1"H"		Cost Base (Dec) 1999 (\$x1000)										
Plant Size: 384.4 MW _{net}		Estimate Type: Conceptual										
TOTAL PLANT COST SUMMARY												
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor		Sales Tax	Bare Erected Cost \$	Eng'g CM H.O.& Fee	Contingencies		TOTAL PLANT COST	
				Direct	Indirect				Process	Project	\$	\$/kW
5A	GAS CLEANUP & PIPING											
	5A.1 Gas Desulfurization(Trans.Reactor)											
	5A.2 Sulfur Recovery (Sullator Sys.)											
	5A.3 Chloride Guard											
	5A.4 Particulate Removal											
	5A.5 Blowback Gas Systems											
	5A.6 Fuel Gas Piping											
	5A.9 HGCU Foundations											
	SUBTOTAL 5A											
5B	CO ₂ REMOVAL & COMPRESSION											
	5B.1 CO ₂ Removal System											
	5B.2 CO ₂ Compression & Drying											
	SUBTOTAL 5B											
6	COMBUSTION TURBINE/ACCESSORIES											
	6.1 Combustion Turbine Generator	47,902		3,570	250		\$51,722	3,103	5,172	6,000	\$65,997	172
	6.2 Combustion Turbine Accessories	w/6.1										
	6.3 Compressed Air Piping		320	529	37		\$886	53		282	\$1,221	3
	6.9 Combustion Turbine Foundations		\$320	\$4,099	\$287		\$52,608	\$3,156	\$5,172	\$6,281	\$67,218	175
	SUBTOTAL 6	\$47,902	\$320	\$4,099	\$287		\$52,608	\$3,156	\$5,172	\$6,281	\$67,218	175
7	HRSG, DUCTING & STACK											
	7.1 Heat Recovery Steam Generator	13,986		5,745	402		\$20,133	1,208		2,134	\$23,476	61
	7.2 HRSG Accessories											
	7.3 Ductwork											
	7.4 Stack											
	7.9 HRSG,Duct & Stack Foundations		281	402	28		\$711	43		226	\$980	3
	SUBTOTAL 7	\$13,986	\$281	\$6,147	\$430		\$20,844	\$1,251		\$2,360	\$24,455	64
8	STEAM TURBINE GENERATOR											
	8.1 Steam TG & Accessories	12,840		2,813	197		\$15,849	951		1,680	\$18,480	48
	8.2 Turbine Plant Auxiliaries	81		275	19		\$375	23		40	\$437	1
	8.3 Condenser & Auxiliaries	2,171		881	62		\$3,114	187		330	\$3,631	9
	8.4 Steam Piping	1,776		2,287	160		\$4,222	253		895	\$5,371	14
	8.9 TG Foundations		370	1,005	70		\$1,446	87		460	\$1,992	5
	SUBTOTAL 8	\$16,868	\$370	\$7,261	\$508		\$25,007	\$1,500		\$3,405	\$29,912	78
9	COOLING WATER SYSTEM											
	9.1 Cooling Towers	1,653		538	38		\$2,229	134		236	\$2,599	7
	9.2 Circulating Water Pumps	417		59	4		\$480	29		51	\$560	1
	9.3 Circ. Water System Auxiliaries	131		28	2		\$160	10		17	\$187	0
	9.4 Circ. Water Piping		1,930	795	56		\$2,781	167		590	\$3,538	9
	9.5 Make-up Water System	1,166		1,280	90		\$2,536	152		538	\$3,226	8
	9.6 Component Cooling Water Sys	118		154	11		\$424	25		90	\$540	1
	9.9 Circ. Water System Foundations		728	1,847	129		\$2,704	162		860	\$3,726	10
	SUBTOTAL 9	\$3,486	\$2,799	\$4,701	\$329		\$11,315	\$679		\$2,381	\$14,375	37

Client: EPR/DOE VISION 21		Report Date: 12-Jul-2000								
Project: INNOVATIVE POWER CYCLES		10:55 AM								
Case: TOTAL PLANT COST SUMMARY		Cost Base (Dec) 1999 (\$x1000)								
Plant Size: Natural Gas Combined Cycle-1x1"H"		Estimate Type: Conceptual								
384.4 MW.net										
Acct No.	Item/Description	Equipment Cost	Material Cost	Labor	Sales Tax	Bare Erected Cost \$	Eng'g CM H.O. & Fee	Contingencies	TOTAL PLANT COST \$	\$/kW
				Direct	Indirect			Process	Project	
10	ASH/SPENT SORBENT HANDLING SYS									
10.1	Gasifier Ash Removal			616	43		\$1,130	68	120	\$1,317
10.2	Gasifier Ash Depressurization	471		55	4		\$519	31	55	\$605
10.3	Cleanup Ash Depressurization	460		136	10		\$713	43	113	\$869
10.4	High Temperature Ash Piping	567		3,448	241		\$4,450	267	943	\$5,660
10.5	Other Ash Recovery Equipment		760	909	92		\$2,313	139	490	\$2,942
10.6	Ash Storage Silos		236	1,134	79		\$1,449	87	230	\$1,766
10.7	Ash Transport & Feed Equipment			89	6		\$164	10	26	\$200
10.8	Misc. Ash Handling Equipment	69		88	6		\$2,482	149	395	\$3,026
10.9	Ash/Spent Sorbent Foundation	2,388		251	18		\$332	20	106	\$457
	SUBTOTAL 10.						\$13,551	\$813	\$2,478	\$16,842
11	ACCESSORY ELECTRIC PLANT									
11.1	Generator Equipment									
11.2	Station Service Equipment									
11.3	Switchgear & Motor Control									
11.4	Conduit & Cable Tray									
11.5	Wire & Cable									
11.6	Protective Equipment									
11.7	Standby Equipment									
11.8	Main Power Transformers									
11.9	Electrical Foundations									
	SUBTOTAL 11.									
12	INSTRUMENTATION & CONTROL									
12.1	IGCC Control Equipment									
12.2	Combustion Turbine Control									
12.3	Steam Turbine Control									
12.4	Other Major Component Control									
12.5	Signal Processing Equipment									
12.6	Control Boards, Panels & Racks									
12.7	Computer & Accessories									
12.8	Instrument Wiring & Tubing									
12.9	Other I & C Equipment									
	SUBTOTAL 12.									
13	IMPROVEMENTS TO SITE									
13.1	Site Preparation									
13.2	Site Improvements									
13.3	Site Facilities									
	SUBTOTAL 13.									
14	BUILDINGS & STRUCTURES									
14.1	Combustion Turbine Area									
14.2	Steam Turbine Building									
14.3	Administration Building									
14.4	Circulation Water Pump house									
14.5	Water Treatment Buildings									
14.6	Machine Shop									
14.7	Warehouse									
14.8	Other Buildings & Structures									
14.9	Waste Treating Building & Str.									
	SUBTOTAL 14.									
	TOTAL COST									